
**KEY TO THE FAMILIES AND GENERA OF THE ORDER
THYSANURA.**

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The order Thysanura comprises on the whole, a group of very small insects, the largest of which do not much exceed 25 mm. in length. They may be found in almost every conceivable locality, under old logs, in moss and grass, along the margin of stagnant pools and even in our dwellings. Yet strange to say since the time of Degeer, Nicolet and Sir John Lubbock but little has been added to our knowledge of Thysanura and the study of this most interesting order of insects has till within the last few years been very much neglected.

As in all other branches of science, much confusion has arisen as to the identity of species. This is due partly to the fact that the descriptions given by the early writers are frequently so short and incomplete that the species, or even the genus, cannot

be satisfactorily determined; and, partly from the fact that many of the species vary greatly as to color, or the young of one species resembling the adult of another. All this has had a tendency to discourage further research. Adequate keys have been prepared but the most of them have dealt only with Old World species.

The present key has not been thoroughly tested, but it is hoped that it will aid somewhat the research in American species. It has been adapted from "Die Gattungen und Arten der Apterygogenea (Brauer)," by Dr. K. W. v. Dalla Torre, published in 1895, but I believe it will apply to most of our genera.

I desire here to extend my thanks to Dr. L. B. Walton and Prof. Herbert Osborn for the valuable suggestions concerning the preparation of this publication. The accompanying plate has been made by my wife, who has given me the greatest assistance throughout the entire work.

NOTE—The following key has been prepared in advance of a more extended work on the Thysanura of Ohio. Any suggestions or specimens will be gladly received.

KEY TO THE FAMILIES AND GENERA OF THE ORDER THYSANURA.

A: Mouthparts well developed, palpi distinctly visible, antennae usually many jointed, caudal end of body usually provided with a pair of jointed filamentous or forcep-like appendages and without a ventral sucker.

SUB-ORDER, I. CINURA.

- B: Body covered with scales. Fam: 1. LEPISMIDAE.
 C: Eyes absent. Gen. 1 (1) *Troglodromicus*.
 CC: Eyes present.
 D: Eyes large, contiguous or nearly so. Gen. 2 (2) *Machilis*.
 DD: Eyes small and separated.
 E: Caudal appendages very short. Gen. 3 (3) *Lepismina*.
 EE: Caudal appendages nearly as long as body. Gen. 4 (4) *Lepisma*.
 BB: Body not covered with scales.
 C: Abdomen without caudal appendages. Fam: 2. ANISOSPHAERIDAE
 D: A single genus. Gen. 1 (5) *Anisosphaerae*.
 CC: Caudal appendages, simple segmented filaments or sickle-shaped.
 D: Caudal appendages sickle-shaped. Fam: 3. IAPYGDIAE
 E: A single genus. Gen. 1 (6) *Iapyx*.
 DD: Caudal appendages many jointed filaments. Fam.: 4 CAMPODEIDAE.
 E: Two caudal appendages. Gen. 1 (7) *Campodea*.
 EE: Three caudal appendages. Gen: 2 (8) *Nicoletia*.

AA: Mouthparts retracted, palpi not distinctly visible, antennae usually 4-8 jointed, a forked sucker on the ventral side of abdomen, a saltatorial appendage usually near caudal end of abdomen. (See drawings.)

SUB-ORDER, II. COLLEMBOLA.

- B: Saltatorial organ present.
 C: Saltatorial organ attached on the penultimate abdominal segment.
 D: Abdomen globular, only slightly longer than broad. Fam: 5. SMINTHURIDAE.
 E: Terminal segment of antennae short, with whorls of hairs. Gen: 1 (9) *Papirius*.

EE: Terimnal segment of antennae long, annulate.

F: Antennae with 8 segments, abdomen with 2 tubercles.

Gen: 2 (10) *Dicyrtoma*.

FF: Antennae with 4 segments, abdomen without tubercles.

Gen: 3 (11) *Sminthurus*.

DD: Abdomen clyindrical, longer than broad.

Fam: 6, ENTOMOBRYIDAE.

E: Body naked or covered with hair.

F: Antennae of 6 segments. Gen: 1 (12) *Orchesella*.

FF: Antennae of 4-5 segments.

G: 2 ocelli on either side of head. Gen: 2 (13) *Sinella*.

GG: 8 ocelli on either side of head.

H: Dorsal portion of third and fourth abdominal segment approximately of equal length.

I: Central part of saltatorial organ not reaching over the ventral sucker.

Gen: 3 (14) *Isotoma*.

II: Central part of saltatorial organ reaching beyond ventral sucker.

Gen: 4 (15) *Corynothrix*

HH: Dorsal portion of fourth abdominal segment 3-4 times longer than third.

I: Distal end of saltatorial organ curved, without antiapical hooks.

Gen: 5 (16) *Drepanura*.

II: Distal end of saltatorial organ simple, with antiapical hooks.

J: Ocelli irregularly arranged, not in 2 longitudinal and 4 transverse rows.

Gen: 6 (17) *Entomobrya*.

JJ: Ocelli symetrically arranged in 2 longitudinal and 4 transverse rows.

Gen: 7 (18) *Salina*.

EE: Body covered with flat scales.

F: Antennae of 4 segments.

G: Distal segment of antennae annulate.

H: Ocelli present. Gen: 8 (19) *Tomocerus*.

HH: Ocelli absent.

I: Antennae longer than body, saltatorial organ with long distal segment.

Gen: 9 (20) *Tritomurus*.

II: Antennae half as long as body, saltatorial organ with very short distal segment.

Gen: 10 (21) *Heteromurus*.

GG: Distal segment of antennae not annulate.

H: Ocelli absent. Gen: 11 (22) *Cyphodeirus*.

HH: Ocelli present.

I: Pronotum simple, head prominent.

J: Metathorax enlarged into hump.

Gen: 12 (23) *Campylothorax*.

JJ: Metathorax simple.

K: Middle part of saltatorial organ spiny.

Gen: 13 (24) *Dicranocentrus*.

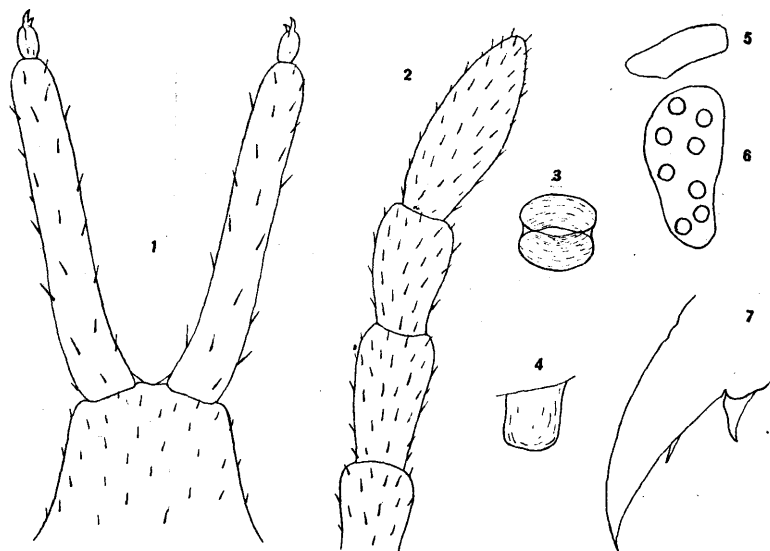
KK: Saltatorial organ smooth.

L: Fourth abdominal segment almost 3 times as long as third.

Gen: 14(25)*Pseudosira*.

- LL: Fourth abdominal segment 4-5 times as long as third.
 M: Fourth abdominal segment, 5 times as long as third, 6 ocelli on either side
 Gen: 15(26)
Trichocorypha.
 MM: Fourth abdominal segment 4 times as long as third.
 N: 8 Ocelli on either side.
 Gen: 16(27)
Seira.
 NN: 4 Ocelli on either side.
 Gen: 17(28)
Paronella.
 II: Pronotum extending over head and partially concealing it.
 J: 8 Ocelli on either side.
 Gen: 18 (29) **Lepidocyrtus.**
 JJ: 6 Ocelli on either side.
 Gen: 19 (30) **Calistella.**
 FF: Antennae of 5 segments.
 G: Eye-spot with 1 ocellus, terminal segment of antennae annulate.
 Gen: 20 (31) **Templetonia.**
 GG: Eye-spot with 8 ocelli, terminal segment of antennae simple.
 Gen: 21(32) **Strongylonotus.**
 CC: Saltatorial appendage attached to antipenultimate abdominal segment.
 Fam: 7. **PODURIDAE.**
 D: Mouth-parts extending cone-like from front of head.
 Gen: 1 (33) **Gnathocephalus.**
 DD: Mouth-parts not appearing cone-like from front of head.
 E: Antennae of 5 segments. Gen: 2 (34) **Deuterolubbockia.**
 EE: Antennae of 4 segments.
 Tarsus with 2 claws.
 G: Abdomen without terminal spur.
 Gen: 3 (35) **Achorutes.**
 GG: Abdomen with terminal spurs.
 H: Abdomen with 2 terminal spurs.
 Gen: 4 (36) **Schoturus.**
 HH: Abdomen with 4 terminal spurs.
 Gen: 5 (37) **Tetracanthella.**
 FF: Tarsus with 1 claw.
 G: Ocelli, 14-15 on either side.
 Gen: 6 (38) **Podurhippus.**
 GG: Less than 14-15 ocelli on either side.
 H: Terminal spur absent.
 I: Saltatorial organ long, curved, extending from posterior end of body.
 Gen: 7 (39) **Podura.**
 II: Saltatorial organ short, simple, not reaching the posterior end of body.
 J: Legs long, distinctly visible from above.
 Gen: 8 (40) **Pseudachorutes.**

- JJ: Legs very short, not visible from above. Gen: 9 (41) *Brachysius*.
 HH: Terminal spur present.
 I: 2 terminal spurs. Gen: 10 (42) *Xenylla*.
 II: More than 2 terminal spurs.
 J: 3 terminal spurs. Gen: 11 (43) *Friesae*.
 JJ: 4 terminal spurs. Gen: 12 (44) *Oudemansia*.
 BB: Saltatorial organ absent. Fam.: 8 APHORURIDAE.
 C: Mouth-parts not placed cone-like under the head.
 D: Tarsus with 2 distinct claws. Gen: 1 (45) *Aphorura*.
 DD: Tarsus with 1 distinct claw.
 E: Post-antennal organ absent. Gen: 2 (46) *Anurophorus*.
 EE: Post-antennal organ present.
 F: Terminal spur present, post-antennal organs placed in rows. Gen: 3 (47) *Tullbergia*.
 FF: Terminal spurs absent, post-antennal organs in circles. Gen: 4 (48) *Anurida*.
 CC: Mouth-parts appearing cone-like on under side of head.
 D: 3 ocelli on either side of head. Gen: 5 (49) *Neanura*.
 DD: Ocelli absent.
 E: Post-antennal organs present. Gen: 6 (50) *Aphoromma*.
 EE: Post-antennal organs absent. Gen: 7 (51) *Tetrodontophora*.



EXPLANATION OF DRAWINGS.

The terminology used is practically the same as in other groups of insects, with the exception of the sub-order, Collembola, which are peculiar in that they possess a ventral sucker, and saltatorial appendage. The following drawings were taken from the genus, *Isotoma*, which is one of the most generalized of the entire group.

Fig. 1. Saltatorial appendage. Fig. 2. Antenna. Fig. 3. Ventral view of sucker. Fig. 4. Side-view of sucker. Fig. 5. Post-antennal organ. Fig. 6. Left eye spot showing the ocelli. Fig. 7. Foot.